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Awareness and Perception as Factors in the Consumption of Homemade Alcoholic Beverage among Irele Community Members, Ondo State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors DA, AAF and EA designed the study. All authors were involved in the data collection and statistical analysis. Author AMA wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: We assessed the perception and pattern of consumption of homemade alcoholic beverages among community members in Irele Local Government Area (LGA), Ondo State, Nigeria following an outbreak of acute methanol poisoning in the LGA in April, 2015.
Study Design: This is a descriptive cross-sectional study.

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Place and Duration of Study: This study was conducted in two communities affected by an incident of acute methanol poisoning in Irele LGA in May, 2015.
Methodology: A multistage sampling technique was employed to select 197 community members who were interviewed using a semi-structured questionnaire. Data were obtained on the socio-demographic characteristics, knowledge, perception and consumption of homemade alcohol. The perception of respondents was determined by assigning a point each to 13-item statements indicating right views about alcohol consumption. Respondents with scores above 7 points were considered as those with favorable perception.
Results: Two hundred participants were approached, out of whom 197 responded. In general, 45.7% had favorable perception and 66.0% reported to be currently taking homemade alcoholic beverages. Although, 70.1% of the respondents were aware of the long-term health effects of consumption of the beverages, only few among those that were aware knew major health effects such as liver cirrhosis (11.5%) and cancer (0.7%). Significantly, having secondary education and above (OR=2.9, 95% CI=1.2-6.9), not taking of homemade alcoholic beverages (OR=3.3, 95% CI=1.8- 6.2) and being aware of the health effects of their consumption (OR=2.9, 95% CI=1.5-5.8) were predictors of favorable perception.
Conclusion: The level of consumption of the homemade alcoholic beverages was high among the community members, although, few had good knowledge and favorable perceptions about their intake. Education interventions on the health consequences of taking the locally made alcohol should target those with low level of education and currently taking the substances.

Keywords: Homemade alcoholic beverages; harmful drinking behavior; acute methanol poisoning.

1. INTRODUCTION

The rate of alcohol consumption is on the increase in many countries in the world with high prevalence of consumption reported among adolescents and young adults [1]. Excessive consumption of these substances has been reported to have adverse health and social consequences arising from its intoxicating abilities [2]. In developing countries, alcohol-related burden accounted for 9.2% of the global disease burden with about 2.5million alcohol related death reported in previous report in Nigeria in 2010 [3].

The homemade alcoholic beverages commonly referred to as 'ogogoro' in Nigeria is locally prepared from palm trees with ethanol as the main active ingredient. These beverages are widely homebrew and sold at various locations such as car parks, beer shops, clubs, parties and so on. Consumption of alcoholic drinks often slow down the functions of the central nervous system and impairs judgment, emotion, abilities and behaviors because of their effects [4]. Alcoholic drinks may also cause various health conditions which can be short-term and long-term depending on how much taken and the physical condition of the individual. The short-term health effects of alcoholic drinks include slurred speech, drowsiness, vomiting, headaches and impaired judgment among others. The long-term health effects are associated with continuous consumption of the drinks in large amounts and they include; unintentional injuries such as car crash, falls, burns, drowning; intentional injuries such as firearm injuries, sexual assault, domestic violence, esophageal cancer, liver cirrhosis, liver cancer, epilepsy, high blood pressure and other heart related diseases [5]. Despite these consequences, the alcoholic beverages are still widely produce and consume in most parts of Nigeria because of the cultural and economic significance attached to their intake.

In Ondo State, the homemade alcoholic beverages are consumed widely and have become an integral part of everyday diet in some parts particularly the rural areas. In Irele Local Government Area (LGA), the homemade alcoholic beverages have different cultural and economic role. For instance, during the spiritual ceremonies, the beverages are widely produced and consume to appease the local deity. The production of these beverages also contributes significantly to the economy of the areas because they are widely sold in the communities in the LGA as well as in other LGAs of the state.

In April 2015, the effect of consumption of homemade alcoholic beverages resulted in sudden deaths with clinical features suggestive of acute methanol outbreak in Irele and Odigbo local government areas (LGAs) of the state. Investigations conducted during the outbreak

confirmed that the homemade alcoholic beverages produced and consumed in the communities contained high concentration of methanol ranging between 4.5 to 16.9%, with a total of 37 cases including 27 fatalities recorded in the affected LGAs [6]. Those affected in these LGAs presented with diverse kinds of symptoms such as headache, blurring of vision, loss of sight, restlessness, seizure and coma [6].

Although, different public health measures including mass media campaigns were embarked upon to prevent the production and consumption of the homemade alcoholic beverages in the study area, the traditional institutions and community members strongly believed that the ailments and deaths were the wrath of a local deity, on those who stole or conspired in the stealing of ancients artifacts at the shrine of the god. This kind of perception among the community members may obstruct public health interventions designed to prevent the consumption of the homemade alcoholic substances. Information on factors which may influence such perceptions will be important in designing and evaluating effective interventions. There is therefore a need to investigate the awareness of the health effects, perceptions and pattern of consumption of the homemade alcoholic beverages, as well as identify factors influencing perception about intake among community members in Irele LGA. This is key to provide information on the magnitude and baseline information upon which specific interventions can be implemented and evaluated.

2. METHODOLOGY

2.1 Study Area

The study was conducted in Irele LGA of Ondo State following an incident of acute methanol poison in the LGA in April, 2015 [6]. The LGA is among the 18 LGA of Ondo State. It has ten political wards. Most inhabitants are of Ikale ethnic extraction with few Urhobo and Edo speaking settlers. The vast majority of the population in these areas speaks Yoruba language and are peasant farmers cultivating food and cash crops at a small-scale level. The study was conducted in Irele and Ayadi communities, which were the two major areas affected by the outbreak of acute methanol poison in the Irele LGA. Irele community has an area of 963 square kilometers, and a population of 145,166 projected from the 2006 census [7]. On average, there are 20,738 house buildings in Irele town. Also, Ayadi community is a rural area of the LGA with a population estimate of 24,448 people and 4,889 house buildings [8].

2.2 Study Design and Population

A descriptive cross-sectional survey was carried out in May, 2015. The study population consisted of adults (18 years and above) who had lived in the study area for more than a year. Individual on transit or on temporary visit and those who refused to give consent to participate in the study were excluded.

2.3 Sample Size Determination and Sampling Method

A sample size of 174 respondents was estimated using the Cochrane's formula ($n=Z^2pq/d^2$) for optimum sample size determination in cross-sectional studies [9], assuming a type 1 error (α) of 0.05, (in a two-sided test), a prevalence of 72% from a previous study [10] and an absolute precision (d) of 5%. A non-response rate of 10% was also factored into the calculated sample size. A multi-stage sampling technique was used to select the study participants. At the first-stage, houses in the outbreak affected communities of Irele and Ayadi constituted the sampling frame. The number of houses which corresponded to the sample size were selected by systematic random sampling technique. The first house selected was done by simple random sampling from a list of buildings 1 to K and subsequently, every Kth building was selected until the sample size was reached. The K factor was derived from the formula K= N/n, where N is the total number of house in the communities and n is the total house required to meet up the sample size. In the second stage, a household in the selected house was included in the study. A household represents one or more people who live in the same dwelling and also share meals or living accommodation. In a multi-households' dwellings, a household was selected by simple random sampling using the table of random numbers after a list of households in the house was generated. In the third stage, an eligible participant in a household was selected. Where there were more than one eligible household participant, a simple random sampling technique by balloting was used to select one.

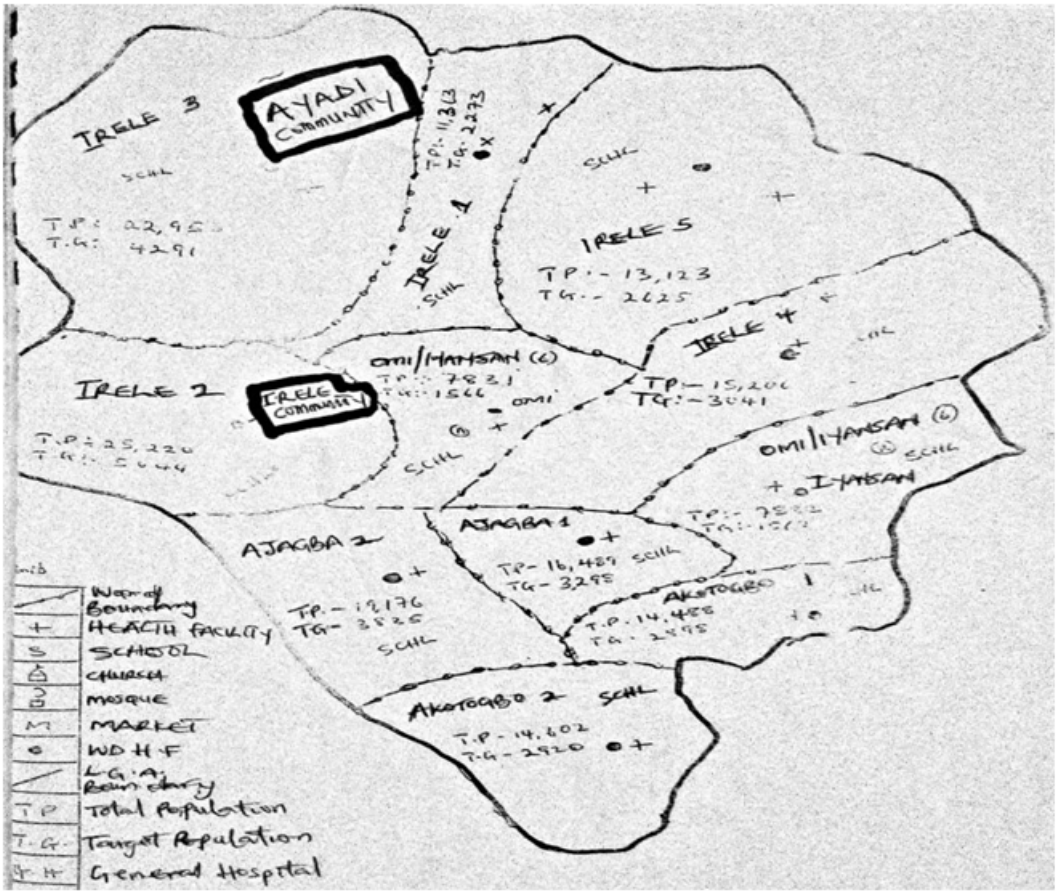

Fig. 1. Map of Irele local government area showing the study areas

2.4 Data Collection and Management

A semi-structured interviewer-administered questionnaire was used to collect data from the respondents on their socio-demographic characteristics, pattern of homemade alcoholic beverages consumption, knowledge of health effects of homemade alcoholic beverages, and perceptions about the consumption of the homemade alcoholic beverages. The questionnaire was modified from findings of previous studies in [4,11,12].

Perception of respondents to homemade alcoholic beverages was measured with a 13-item questionnaire. All questions were based on respondents' view or perception about the consumption of homemade alcoholic beverages. A mark was assigned to each of the statements indicating positive perception about the consumption of the alcoholic beverages. Participants with positive perception are those that did not approve the consumption of the homemade alcoholic beverages because of their negative health effects during the methanol poison outbreak. On aggregate, respondents with scores above the median score of 7 points were considered as those with favorable perception about their consumption. The perception scale was pre-tested in Akure south LGA, Ondo State before administering in the study area.

The data was entered in an excel sheet and analyzed using Stata version 12. Frequency tables, pie charts and cross-tabulations were generated and level of significance was determined at a p-value of less than 0.05. The outcome variable was the perception of respondents to consumption of the homemade alcoholic beverages. Chi-square test was used to identify factors affecting respondents' perception to homemade alcohol intake while the predictors of the intake were identified using logistic regression analysis. Variables significant at $p<0.2$ on the bivariate analysis were included in

the logistic regression analysis to estimate the adjusted odds ratio [13].

Ethical approval for the study was obtained from the Ethical Review Committee of the Ondo State ministry of health. A written informed consent was obtained from the participants before administering the questionnaire. The participants voluntarily decide to participate in the study after understanding the questions and the study procedures. There was no penalty attached to those who declined to participation in the study. To ensure confidentiality of the data obtained, the questionnaires were identified only with numbers, and every data collected was safely locked and protected from third party. The interviews were conducted in a friendly manner that enabled participants willingly provide information. The research does not require collection of invasive materials. Therefore, the safety of the participants was guaranteed. The only discomfort that may occur was the time taken in responding to the questions, which was kept minimal.

3. RESULTS

3.1 Socio-demographic Characteristics of Respondents in Irele LGA

A total of 200 participants were approached, out of whom 197 were interview, giving a response rate of 98.5%. Seventy-two (36.5%) of the respondents were between 18-30 years of age with mean age of 34.4 (±11.1) years. Majority (82.2%) of the respondents were males, and 72.6% were married. High proportion (55.8%) of the respondents had a secondary level of education, 165 (83.8%) were Christians and 90.4% were from the Yoruba ethnic group (Table 1).

3.2 Respondents' Knowledge of Health Effects of Homemade Alcoholic Beverages

More than half of the respondents reported that they were aware of the ingredients used to make the homemade alcoholic beverages with 99% reporting palm wine as the main active ingredient. Majority (70.1%) of the respondents reported that they were aware of the health effects of the homemade alcoholic beverages, however, few among those that were aware knew the long-term health effects of the beverages such as liver cirrhosis (11.5%), cancer (0.7%) and diabetes (0.7%) (Table 2).

Table 1. Socio-demographic characteristics of respondents in Irele LGA

Socio-demographic variables	Frequency n=197(%)
Age	
Mean (SD)	34.4±11.1
18-19	8 (4.0)
20-29	64 (32.5)
30-39	65 (32.9)
40-49	46 (23.4)
50-80	14 (7.2)
Sex	
Male	162 (82.2)
Female	35 (17.8)
Marital status	
Single	54 (27.4)
Married	143 (72.6)
Educational status	
No formal	5 (2.5)
Primary	29 (14.7)
Secondary	110 (55.8)
Tertiary	53 (26.9)
Religion	
Christianity	165 (83.8)
Muslim	26 (13.2)
Traditional	6 (3.0)
Ethnicity	
Igbo	15 (7.6)
Yoruba	178 (90.4)
Others	4 (2.0)
Annual Income (naira)	
<18,000	74 (37.6)
≥18,000	116 (58.9)
None	7 (3.6)

3.3 Perceptions about the Consumption of Homemade Alcoholic Beverages among Respondents in Irele LGA

Table 3 shows respondents' views or perceptions about the consumption of the homemade alcoholic beverages among the general population. Slightly below half (48.7%) of the respondents thought that the alcoholic drink was part of social life, 18.8% thought it should be consumed daily; 28.9% thought that their consumption was the best way to celebrate life and 34% thought that their intake made one happy. However, 53.8% of the respondents felt that the consumption of the beverages may interfere with their work. In general, 90 (45.7%) of the respondents had favorable perceptions about the intake of homemade alcoholic beverages.

Table 2. Knowledge of health effects of homemade alcoholic beverages among respondents in Irele LGA

Knowledge variables	Frequency N=197 (%)
Knew ingredients used to make homemade alcoholic beverages	
Yes	110 (55.8)
No	87 (44.2)
***Ingredients used in making homemade alcoholic beverage known (n=110)**	
Sugar	4 (3.6)
Palm wine	98 (99.0)
Bamboo	2 (2.0)
Chemical	11 (10.0)
Omo	1 (1.0)
Herbs root	17 (15.4)
Aware of the health effects of homemade alcoholic beverages when consumed	
Yes	138 (70.1)
No	59 (29.9)
***Homemade alcoholic beverages related health conditions known (n=138)**	
Liver cirrhosis	16(11.5)
Diabetes	1 (0.7)
Cancer	1 (0.7)

** Multiple responses*

Table 3. Perceptions about the consumption of homemade alcoholic beverages among respondents

Variables	Perception about homemade alcohol intake n=197 (%)		
	Yes n (%)	No n (%)	Don't know n (%)
Drinking homemade alcoholic beverages is part of social life	96 (48.7)	94 (47.7)	7 (3.6)
Homemade alcoholic beverages should be consumed daily to be strong	37 (18.8)	138 (70.1)	22 (11.1)
Drinking homemade alcoholic beverages is the best way to celebrate	57 (28.9)	133 (67.5)	7 (3.6)
Drinking of homemade alcoholic beverages makes one happy	67 (34.0)	87 (44.2)	43 (21.8)
Consumption of homemade alcoholic beverages makes people forget things	104 (52.8)	50 (25.4)	43 (21.8)
Consumption of homemade alcoholic beverages makes people fat	130 (66.0)	43 (21.8)	24 (12.2)
Drinking of homemade alcoholic beverages is bad for ones' health	129 (65.5)	46 (23.4)	22 (11.1)
Drinking homemade alcoholic beverages may interfere with your work	106 (53.8)	63 (32.0)	28 (14.2)
Taking homemade alcoholic beverages makes one forget all problems	71 (36.0)	79 (40.1)	47 (23.9)
Death can occur if one does not consume homemade alcoholic beverages	21 (10.7)	162 (82.2)	14 (7.1)
Homemade alcoholic beverages prevents the occurrence of diseases	55 (27.9)	99 (50.3)	43 (21.8)
Taking homemade alcoholic beverages makes one look cool	48 (24.4)	95 (48.2)	54 (27.4)
Not taking homemade alcoholic beverages can make one to fall sick	28 (14.2)	145 (73.6)	24 (12.2)

3.4 Pattern of Consumption of Homemade Alcoholic Beverages among Respondents in Irele LGA

Table 4 shows the pattern of consumption of homemade alcoholic beverages among the respondents. Majority (66.0%) of the respondents admitted to be currently taking homemade alcoholic beverages such as "Eere" (mixture of ethanol with roots of different plants) (74/130; 56.9%), "White" (palm wine extract with low concentration of ethanol) (38/103; 29.2%) and Ori emu/Oti (pure extract of palm wine with high concentration of ethanol) (34/130; 26.1%). High proportion (77.7%) of the respondents reported to have been drinking for more than five years, while 36.9% reported to have been taking the beverages occasionally. About half of the respondents were introduced to the consumption of the homemade alcoholic beverages by their friends (41.5%) and 31.5% initiated their consumption by themselves.

3.5 Factors Influencing Perceptions of Respondents about Intake of Homemade Alcoholic Beverages

Significantly, factors that influenced perceptions of respondents about the intake of homemade alcoholic beverages on both the bivariate and logistic regression analysis were educational status, current intake of the beverages and knowledge of health effects (Table 5). The odds of having favorable perceptions about the intake of the homemade alcoholic beverages increased three folds among respondents that had completed secondary or higher level of education compared to those with the primary or lower level of education (AOR=2.9; 95% CI=1.2-6.9). Similarly, the odds of having favorable perception increased three fold among respondents that do not take the alcoholic beverages compared to those that reported intake (AOR=3.3, 95% CI=1.8 -6.2). Awareness of the health consequences of the homemade alcoholic beverages also increased the odds of having favorable perceptions about their consumption (AOR=2.9, 95% CI= 1.5-5.8).

4. DISCUSSION

Findings from our study suggest that the consumption of the homemade alcoholic beverages was high among the respondents. In addition, the knowledge of the health effects of the beverages and perception about their consumption was poor. Factors identified to influence respondents' perceptions about the intake of the alcoholic substances were educational status, current intake of the homemade alcohol and awareness of the health consequences when consumed.

Table 4. Pattern of consumption of homemade alcoholic beverages among respondents in Irele LGA

	Frequency N=197 (%)
Current consumption of homemade alcoholic beverage	
Yes	130 (66.0)
No	67 (34.0)
*** Types of homemade alcoholic beverages currently taking (n=130)**	
Eere	74 (56.9)
White	38 (29.2)
Ori emu/Oti	34 (26.1)
Period homemade alcohol was being consumed (n=130)	
<1 year	3 (2.3)
1-5 year	26 (20.0)
>5 years	101 (77.7)
How often homemade alcohol was taken (n=130)	
Occasionally	48 (36.9)
Often	43 (33.1)
Seldom	39 (30.0)
Persons that introduced the homemade alcohol consumption (n=130)	
Friends	54 (41.5)
Neighbors	2 (1.5)
Parents	23 (17.8)
Relatives	3 (2.3)
Self	41 (31.5)
Others	7 (5.4)

** Multiple responses*

Table 5. Factors influencing perception of respondents about intake of homemade alcoholic beverages

Variables	Perception		Total	P-value	Unadjusted odds ratio	AOR (L –H 95% CI)	P-value
	Good	Poor					
Age							
<30	33 (45.8)	39 (54.2)	72	0.975	1.0		.98
*≥30	57 (45.6)	68 (54.4)	125		1		
Sex							
Male	76 (46.9)	86 (53.1)	162	0.457	1.3		.46
*Female	14 (40.0)	21 (60.0)	35				
Marital status							
Single	26 (48.1)	28 (51.9)	54	0.670	1.1		.67
*Married	64 (44.8)	79 (55.2)	143				
[+]Religion							
Christianity	72 (43.6)	93 (56.4)	165	0.591	1.5	1.7 (0.2-12.5)	.59
Islamic	16 (61.5)	10 (38.5)	26	0.256	3.2	3.5 (0.4-29.8)	.26
*Traditional	2 (33.3)	4 (66.7)	6		1	1	
[+]Educational status							
Secondary and higher	80 (49.1)	83 (50.9)	163	0.016	2.3	2.9 (1.2-6.9)	.02
*Primary and lower	10 (29.4)	24 (70.6)	34	0.036	1	1	.04
Currently taking homemade alcoholic beverages							
No	39 (58.2)	28 (41.8)	67	<0.001	2.2	3.3 (1.8-6.2)	< .001
*Yes	51 (39.2)	79 (60.8)	130	1	1	1	
[+]Knows that consumption of homemade alcoholic beverages affects health							
Yes	72 (52.2)	66 (47.8)	138	0.002	2.5	2.9 (1.5-5.8)	.002
*No	18 (30.5)	41 (69.5)	59		1	1	

[*]Reference group; AOR=Adjusted odds Ratio; H=Higher; L= Lower

[+]Variables included in the multivariate analysis include; religion, educational status, current intake of homemade alcoholic beverages and knowledge of the health effects of consumption of the beverages

The proportion of respondents that admitted to be currently taking the homemade alcoholic beverage in this study was high, and this may imply easy access and widespread use of the substances in the community given that they are socially tolerated and affordable in this area. This is also the situation in most comparable communities in Southern Nigeria [14,15]. However, earlier studies, particularly those carried out in urban centers, had recorded higher levels of abstinence from alcohol intake but did not put into consideration the consumption of locally produced alcoholic beverages [16]. Furthermore, the prevalence of consumption of the locally made beverages in this study is much higher than that (42%) recorded in a comparative study carried out in Jos, North Central, Nigeria [17]. The low prevalence recorded in the study in Jos may be attributed to the sizable Muslim community in the area, given that they are under strict religious injunction to abstain from drinking alcohol.

There have been physical consequences stemming from the heavy use of alcoholic substances. The outbreak of methanol poison linked to the homemade alcoholic beverages in the study area was an example, where those affected were drinkers. In spite of this, we found that majority of the respondents reported to be aware of the health effects, although, few mentioned long-term health effects of these substances and none knew the short-term ones. The high level of awareness of the health effects of the locally made alcoholic beverages may be attributed to campaigns about the injurious effects of use of the locally made substances during the data collection period. However, such campaign may not have translated to high knowledge of the types of health effects caused by the consumption of these beverages among the community members given that few of them mentioned such effects. This finding is consistent with previous reports [18].

Perceptions of respondents about the consumption of homemade alcoholic beverages was assessed using a 13-items module that covers two very important and interacting phenomena which include perceptions about the social significance of the beverages as well as the health significance. We observed that higher proportion of the participants responded positively to majority of items in the modules that are related to health compared to those related to social life. i.e, more of the participants did not support intake of homemade alcoholic beverages because of health reasons compared to the social reasons. This is expected given by the fact that an aggressive community sensitization on circulation of methanol poisoned homemade alcoholic beverages was conducted during the outbreak. Also, respondents may likely not to respond favorably to perceptions items related to social life because consumption of the locally made alcoholic beverages is part of the social life in the communities studied. Furthermore, we observed that the proportion of respondents that responded favorably to all the items in the perception module was below average. Similar observations were also made in previous study [19].

Several factors may influence individual perceptions about intake of alcoholic substances, however; in this study, respondents with at least, secondary level of education had more favorable perception about the consumption of homemade alcoholic beverages compared to those below. This result is not surprising due to the importance of education in communicating essential information about health that can enlighten people about serious health implications of using drugs and alcohol. Earlier study has also shown the impact of education on the risk of drug and alcohol abuse. One particular study in Copenhagen measured schooling level, smoking, alcohol use and obesity. It was found that those with the lowest level of schooling were most frequently heavy drinkers [20]. This suggests that education level may have some influence on those who would abuse alcohol and drugs.

An individual's perceptions regarding the effects of alcohol, referred to as alcohol expectancies, influences the likelihood that alcohol will be consume according to the social learning perspective [21]. In line with this perspective, we found that respondents with non-favorable perceptions about the consumption of the locally made beverages take them more compared to those with favorable perception. Previous studies have also shown similar findings [18,22,23].

In this study, respondents with favorable perception about homemade alcoholic beverages intake were more likely to be aware that the beverages have health effects when consumed. It is assumed that having adequate knowledge of the risks associated with substances use will reduce the rate at which it was consumed. Lack of knowledge of the health effects of these substances leaves people exposed to their use, which may influence their level of perception.

Consistent with our observation, previous authors indicated that poor or low level of awareness of the health effects of substances intake may predict people behavior towards their use [19,24].

5. CONCLUSION

The limitations our methods imposed on the study findings are recognized. The data obtained from the respondents could not be independently validated given that the survey requested for self-reported behaviors. This could result in social desirability bias, a situation in which respondents over report safer behaviors and under report unsafe ones. Also, for the same reason, the responses could have been influenced by recall bias. However, information on current usage of the substances was obtained from the respondents to mitigate such biases. Despite these limitations, the study offers important implications for preventing the consumption of homemade alcoholic beverages. The consumption was high among the respondents. In addition, knowledge of the types of health effects caused by the consumption of the beverages and perceptions about the consumption was poor. Favorable perception about the homemade alcoholic substance use was common, mainly among those with high level of education, those that were not current users of the substance and those that were aware that the intake of the beverages had health consequences. Hence, interventions should target those with low level of education and those currently taking the substances. Also, given by the low level of perception about the consumption of the beverages, there is a need for further investigations on the spiritual beliefs about the consumption of the homemade alcoholic beverages in order to prevent future outbreaks.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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